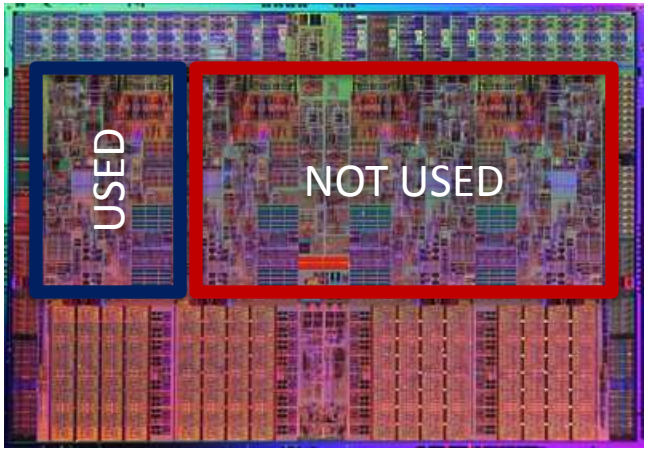
- Industry-wide standard

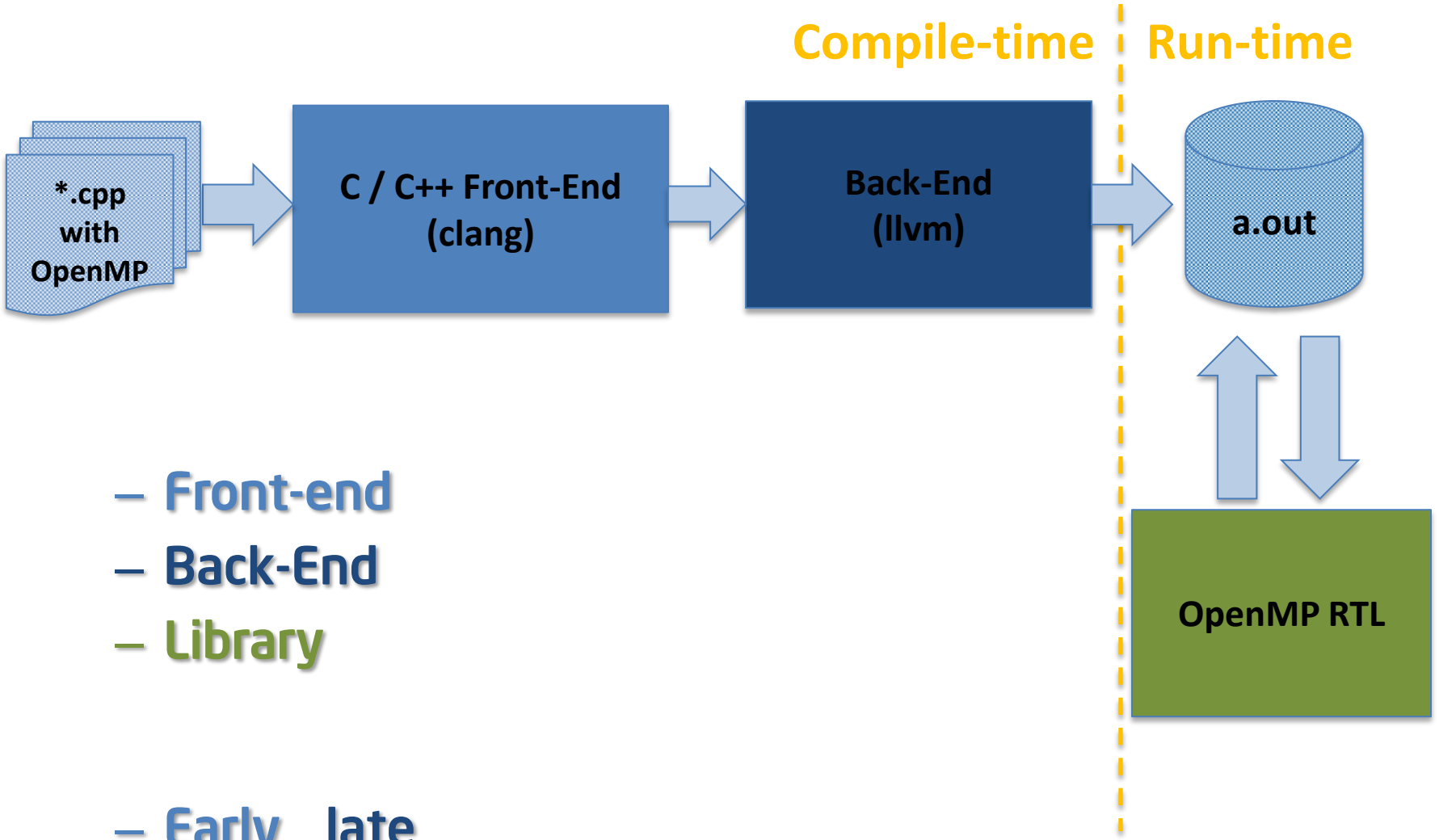
```
#pragma omp parallel for
for (i = 0; i < N; i++)
{
    ...
}
```

- www.openmp.org

- Anyone



Software and Services Group



- Front-end
- Back-End
- Library

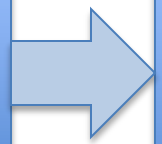
- Early late

Software and Services Group

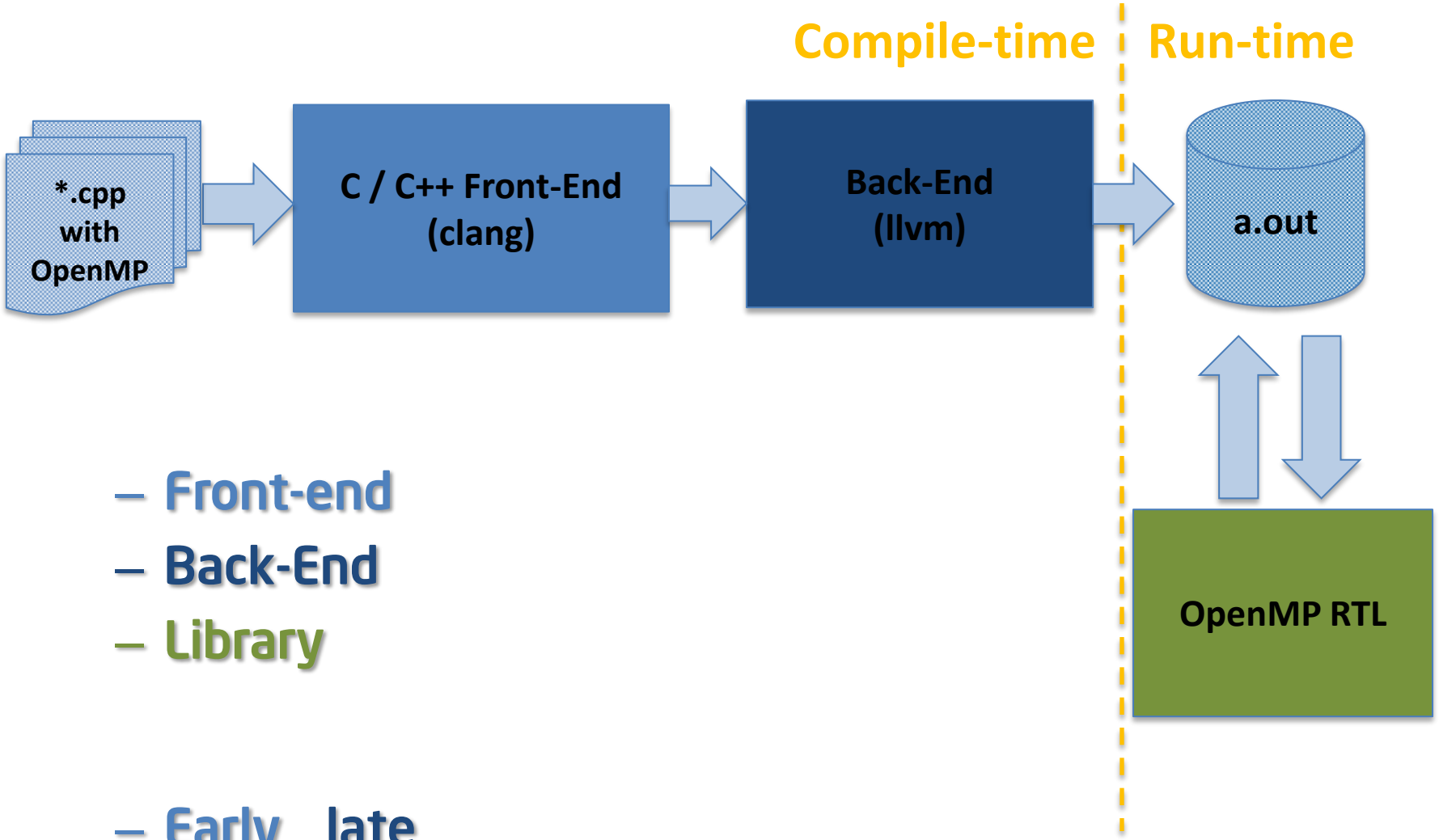
Early Late

front-end back-end

```
float a,x,y,z;
#pragma omp parallel for
for (i = 0; i < N; i++) {
  a[i] = x * y * z;
  ... // rest of loop
}
```



```
omp_parallel_for(0, N,
N/omp_get_num_threads(), forb)
...
void forb(int L, int U, R *r) {
  for (i = L; i < U; i++) {
    r->a[i] = r->x * r->y * r->z;
    ... // rest of loop
  }
}
```



- Front-end
- Back-End
- Library

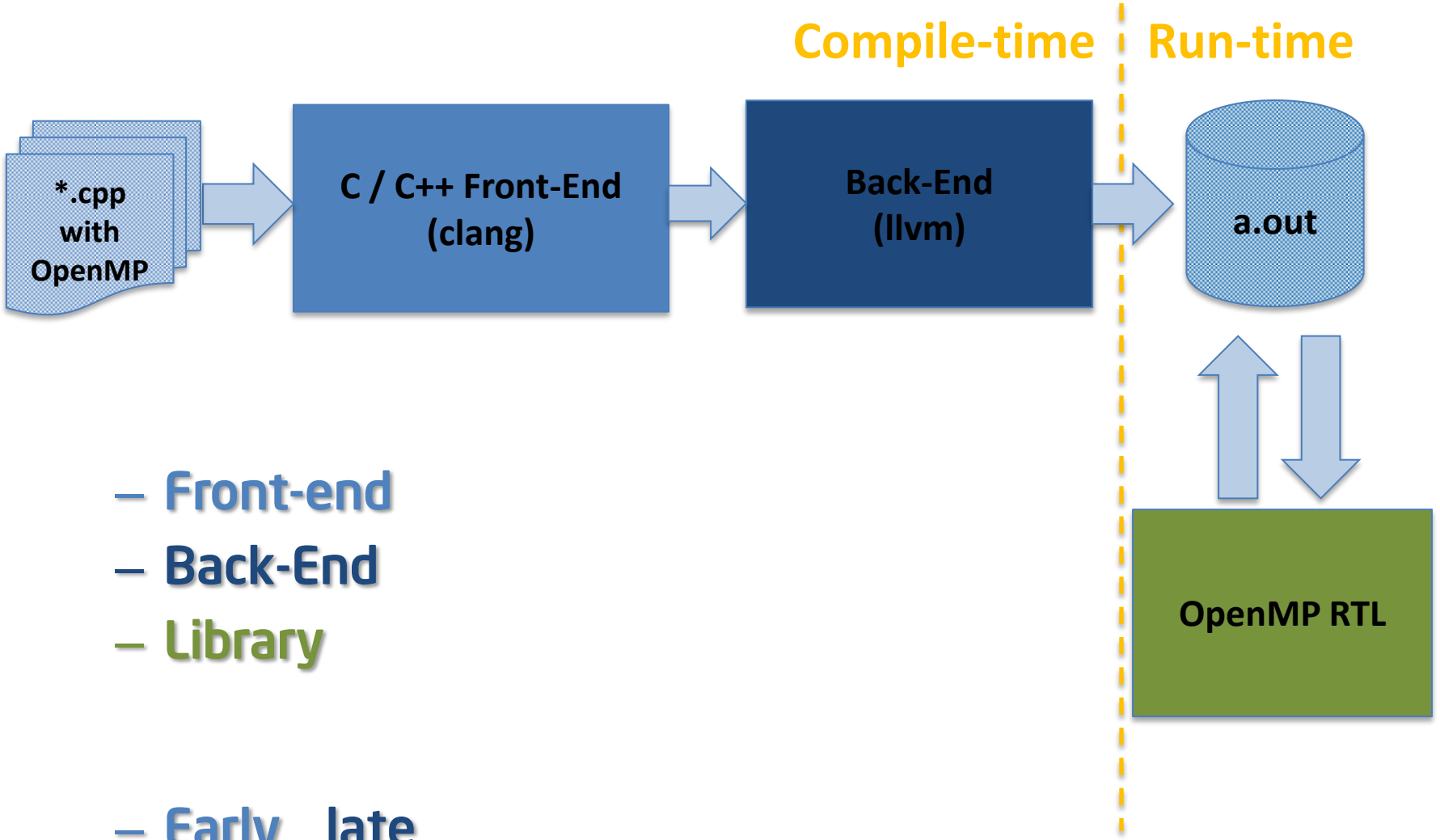
- Early late

GPLv3*

- Permissively licensed

BSD license

www.openmprtl.org



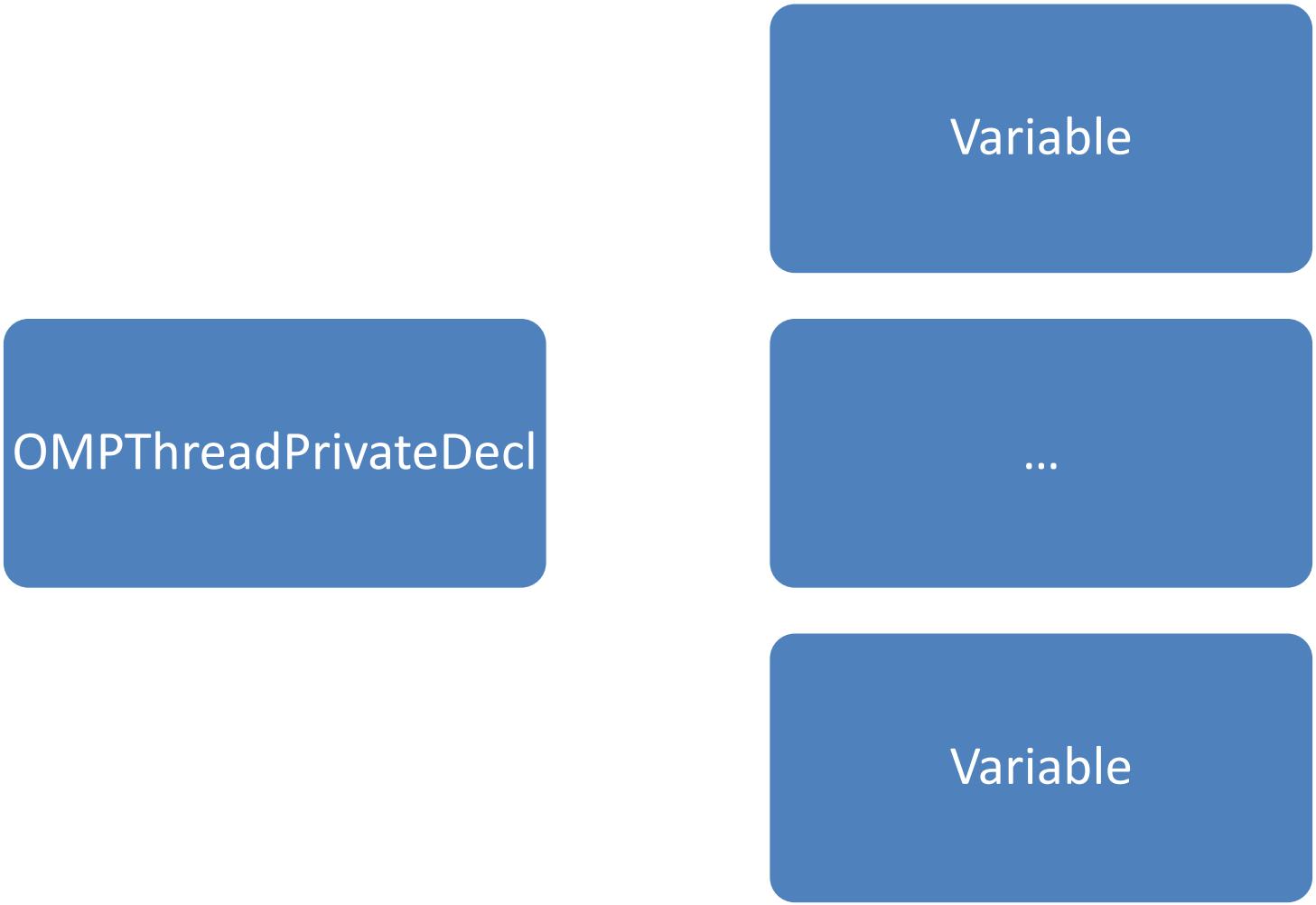
- Front-end
- Back-End
- Library

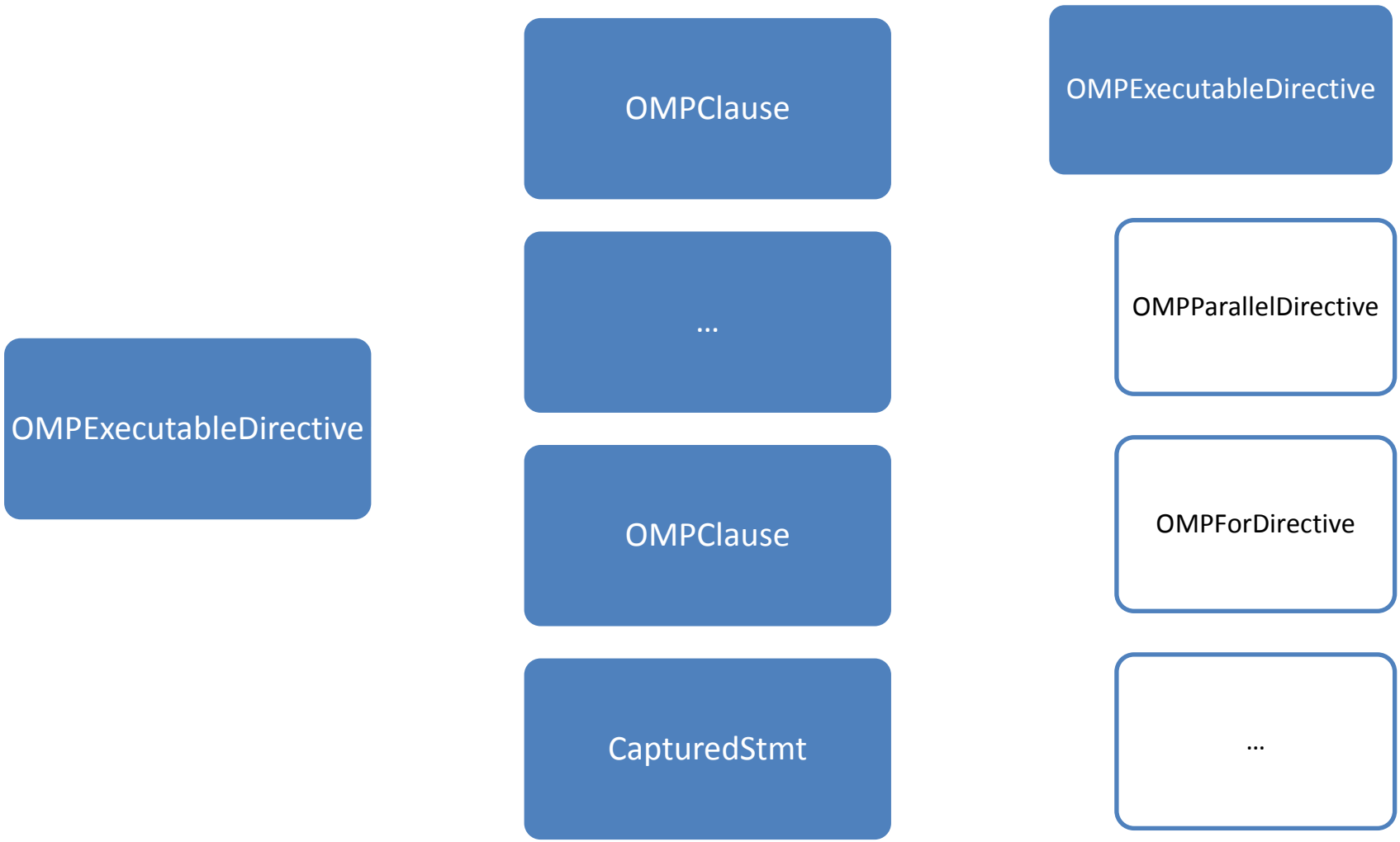
- Early late

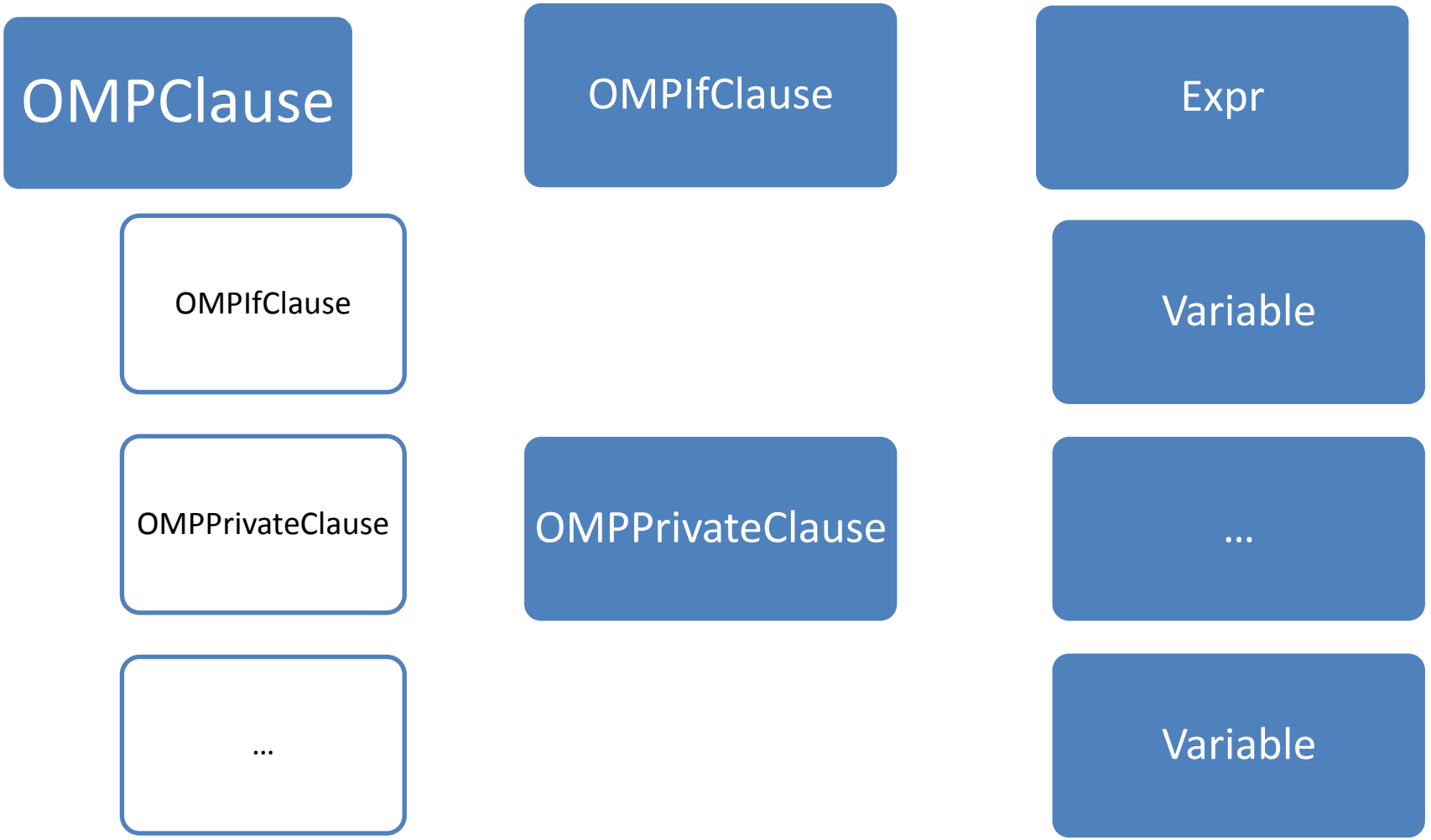
C++11 attributes

standard pragma

parsing harness






OMPClause
OMPIfClause
OMPPrivateClause
...
OMPIfClause
Expr
Variable
OMPPrivateClause
...
Variable

- Statements Structured Statements

CapturedStmt

  - Private constructed
  - Shared captured

```
#pragma omp parallel if(a) private(argc,b)
foo();
```

```
-OMPParallelDirective <line:9:2, col:43>
  | |-OMPIfClause <col:22, col:27>
  | | `-ImplicitCastExpr <col:25> '_Bool' <IntegralToBoolean>
  | |   `-ImplicitCastExpr <col:25> 'int' <LValueToRValue>
  | |     `-DeclRefExpr <col:25> 'int' lvalue Var 'a' 'int'
  | |-OMPPrivateClause <col:28, col:43>
  | | |-DeclRefExpr <col:36> 'int' lvalue ParmVar 'argc' 'int'
  | | `-DeclRefExpr <col:41> 'int' lvalue Var 'b' 'int'
  | `-CapturedStmt <line:10:2, col:7>
  |   `-CallExpr <col:2, col:7> 'void'
  |     `-ImplicitCastExpr <col:2> 'void (*)(void)' <FunctionToPointerDecay>
  |       `-DeclRefExpr <col:2> 'void (void)' lvalue Function 'foo' 'void (void)'
```

auto-

generated record

functions

captured

variables

- Thank you

welcomed

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